NEW AND KNOWN NEMATODES FROM AUSTRALIAN MARSUPIALS.

By T. Harvey Johnston and Patricia M. Mawson, University of Adelaide.

(Thirty-four Text-figures.)

[Read 30th October, 1940.]

Material from various parts of Australia, chiefly from New South Wales and Queensland, has been examined and amongst it were found, in addition to many previously described forms, eight new species, the allotype male of one hitherto incompletely described, and the allotype females of two others. For much of it we are indebted to the late Dr. T. L. Bancroft, Eidsvold, Upper Burnett River, Queensland; Professor J. B. Cleland; Messrs. L. Gallard, Ourimbah, Gosford district, N.S.W.; A. S. Le Souef, Director, Sydney Zoological Gardens; the Tasmanian Biological Survey; and the South Australian Museum. Where not otherwise indicated, the material was collected by the senior author. The investigation was made possible by the Commonwealth Research Grant to the University of Adelaide. Types of new species and the allotypes have been deposited in the South Australian Museum, Adelaide.

A complete list of the material examined and the parasites identified would be largely a repetition of previous findings; consequently in this account only new host records and new species are mentioned. The following is a list of the newly-recorded nematodes arranged under their hosts:

Lagorchestes hirsutus Gould: *Zoniolaimus communis* J. & M.

Macropus dorsalis Gray: *Pharyngostrongylus theta* J. & M., *Cloacina similis* J. & M., *C. digitata*, n. sp., *Zoniolaimus longispicularis* (Wood).

Macropus fuliginosus Desm.: *Dipetalonema roemeri* (Linst.).

Macropus major Shaw: *Cloacina communis* J. & M.

Macropus parma Waterhouse: *Parazoniolaimus collaris* J. & M., *Pharyngostrongylus alpha* J. & M., *P. gamma* J. & M., *P. delta* J. & M., *Coronostrongylus coronatus* J. & M., *Cloacina thetidis* J. & M., *Buccostrongylus buccalis* J. & M.

Macropus robustus Gould: *Pharyngostrongylus beta* J. & M.

Macropus ruficollis Desm.: *Cloacina linstowi*, n. sp., *C. similis* J. & M., *C. thetidis* J. & M., *Coronostrongylus coronatus* J. & M.

Macropus tasmaniensis Le Souef: *Zoniolaimus longispicularis* (Wood).

Macropus thetidis Lesson: *Zoniolaimus onychogale* J. & M., *Cyclostronglus medioannulatus*, n. sp., *Dipetalonema* sp.

Macropus ualabatus Less. & Garn.: *Cloacina gallardi*, n. sp., *Globocephaloides thetidis* J. & M., *Austrostrongylus aggregatus*, n. sp.

Peragale minor Spencer: *Subulura peragale*, n. sp., *Physaloptera thalacomys*, n. sp.

Perameles nasuta Geoffr.: *Physaloptera parvicollaris*, n. sp., *Echinonema cinctum* Linst., *Dipetalonema* sp.

Sarcophilus harrisi Boitard: *Physaloptera sarcophili*, n. sp.

Trichosurus caninus Ogilby: *Dipetalonema trichosuri* (Breinl).

? Bandicoot (*Echymipera* sp. or *Peroryctes* sp.): *Physaloptera papuensis*, n. sp.

New Host Records for Known Species.

The following parasites were found in hosts from which they had not previously been recorded:

Buccostronglus buccalis J. & M. from *Macropus parma* (Ourimbah, N.S.W.); *Cloacina communis* J. & M. from *M. major* (N.S.W.); *Cloacina thetidis* J. & M. from *M. parma* (Ourimbah), *M. ruficollis* and *M. wilcoxi* (Burnett R.); *Cloacina similis* J. & M. from

M. dorsalis, *M. ruficollis* and *M. wilcoxi* (Burnett R.); *Parazoniolaimus collaris* J. & M. from *M. parma* (Ourimbah); *Pharyngostronglus alpha* J. & M. from *M. parma* (Ourimbah); *Pharyngostrongylus beta* J. & M. from *M. robustus* (N.S.W.—Sydney Zoological Gardens); *Pharyngostrongylus delta* J. & M. from *M. parma* (Ourimbah); *Pharyngostrongylus theta* J. & M. from *M. dorsalis* (Burnett R.); *Zoniolaimus longispicularis* (Wood) from *M. dorsalis* (Burnett R.) and *M. tasmaniensis* (Tasmania); *Zoniolaimus onychogale* J. & M. from *M. thetidis* (Burnett R.); *Zoniolaimus communis* J. & M. from *Lagorchestes hirsutus* (Western Australia—Adelaide Museum); *Zoniolaimus* sp. from *M. parma* (Ourimbah); *Dipetalonema trichosuri* (Breinl) from *Trichosurus caninus* (Narara, N.S.W.); and *Dipetalonema roemeri* (Linst.) from *M. fuliginosus* (Kangaroo Island).

Cloacina digitata, n. sp. Figs. 1–4.

Very common in the stomachs of three specimens of *Macropus dorsalis*, Burnett River (coll. T. L. Bancroft). Fairly robust worms, males 4–5 mm., females 4·8–8·7 mm. long. Six shallow lips, each submedian with papilla 12μ long and consisting of two joints, upper very small; each lateral lip with small conical papilla. Buccal capsule 0·02 mm. wide, chitinous walls thin, 0·09 mm. deep. Oesophagus 0·45 mm. long (1:9·5 of body length) in male, 0·48 mm. (1:19 of body length) in female 8·7 mm. long. Nerve ring 0·2 mm., and excretory pore 0·4 mm. from anterior end. Cervical papillae thread-like, 0·04 mm. long, 0·11 mm. from head end.

Male. Bursa large, not deeply lobed, ventral lobes continuous. Ventral rays stout but tapering, cleft half their length; externo-lateral very stout, divergent from laterals; laterals cleft nearly all their length; externo-dorsal arising separately, its tip raising bursal wall; dorsal bifurcating just before its mid-length, each branch ending in two short stout branches; none of the bursal rays reaching bursal edge. Genital cone short, pointed. Spicules 2·1 mm. long (half body length).

Female. Body narrowing posterior to vulva, and ending in thin pointed tail with dorsally-directed tip; vagina fairly short, twisted; vulva 0·2 mm. and anus 0·11 mm. from tip of tail. Eggs 0·1–0·12 mm. by 0·05–0·06 mm. The head of this worm most closely resembles those of *Cloacina elegans* and *C. curta*. It differs from the former in having lips, in the lengths of spicules and vagina, and in the position of nerve ring; and from *C. curta* in the shape of oval papillae, bulb on the posterior end of the oesophagus, and in the length of cervical papillae, spicules and vagina. The specific name has reference to the finger-like form of the submedian papillae.

Cloacina linstowi, n. sp. Figs. 5–7.

From *Macropus ruficollis*, Burnett River (coll. T. L. Bancroft).

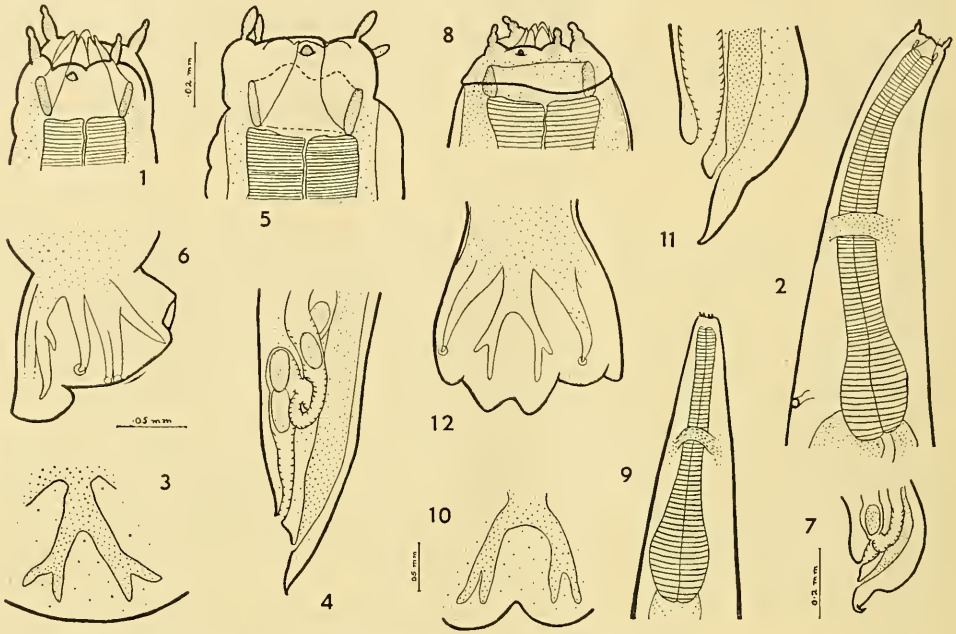
Short stout worms, female 3·4 mm., male 2·4 mm. long. Anterior end surrounded by wide collar bearing six lips; lateral lips each with small conical papilla; submedian each with papilla (10μ long in male) of unusual shape, the base being short and the distal segment very long and thin. Buccal cavity deep, base 0·03 mm. from top of lips; buccal ring 4μ thick, 27μ wide at base, slightly wider at top, and with wavy anterior edge so that depth varies from 14μ to 20μ. Oesophagus in female 0·35 mm. long, ending in bulb. Position of nerve ring in all specimens obscured. Excretory pore in region of third quarter of oesophageal length. Cervical papillae 40μ from anterior end.

Male. Spicules 0·62 mm. long (1:4 of body length). Bursa longer at dorsal than ventral lobes. Ventral rays parallel; externo-laterals reaching bursal edge, divergent from laterals; laterals cleft half length; externo-dorsals arising separately and shorter than laterals; tips of laterals and externo-dorsals directed laterally and elevating bursa. Dorsal ray dividing at end of first quarter, each branch giving off short lateral soon after origin, and neither branch reaching bursal edge.

Female. Body narrowing suddenly beyond vulva and ending in pointed tail, 0·13 mm. long. Vagina very short; vulva 0·18 mm. from posterior end. Eggs in uteri 90μ by 50μ.

The species differs from other members of the genus in the shape of the submedian papillae, the deep buccal capsule, and the dorsal ray of bursa. In the latter feature, in the shape of the papillae, and in the possession of wavy anterior edge of buccal capsule,

this worm very closely resembles *Cloacina dahli*, described by Linstow from *Macropus browni* from New Britain, but differs in the depth of buccal capsule, and in shorter vagina. These differences, combined with very different geographical range of the hosts, are sufficient to distinguish between the two species.



Figs. 1-4.—*Cloacina digitata*. 1, head; 2, anterior end; 3, dorsal rays; 4, posterior end of female. Figs. 5-7.—*Cloacina linstowi*. 5, head; 6, bursa; 7, posterior end of female. Figs. 8-11.—*Cloacina gallardi*. 8, head; 9, anterior end; 10, dorsal ray; 11, posterior end of female. Fig. 12.—*Cloacina thetidis*, bursa. Figs. 1 and 5 drawn to same scale; figs. 2 and 10; figs. 3, 6, 8, and 12; figs. 4, 7, 9, and 11.

CLOACINA GALLARDI, n. sp. Figs. 8–11.

From stomach of *Macropus ualabatus*, Ourimbah, N.S.W. (coll. L. Gallard).

Large worms; males 11–12 mm., females about 13–15 mm. in length. Head with definite collar bearing six lips; submedian papillae of two almost equal joints, rather short; lateral papilla small, conical. Buccal ring large, stouter at base than anterior by 0·08 mm. wide, 0·023 mm. deep, base 0·04 mm. from top of lips, and anterior margin forming a wavy line. Oesophagus 0·82 mm. long in male (1:14 of body length), surrounded by nerve ring at about mid-length, then widening into a slight bulb succeeded by a larger bulb before joining intestine. Cervical papilla about 0·18 mm. from anterior end of worm; excretory pore in region of oesophageal bulb.

Male. Bursa large, lobes not deeply separated from one another. Ventral rays parallel, reaching edge of bursa; externo-lateral and externo-dorsal arising with laterals, but divergent from them, each lifting up lateral wall of bursa a short distance from bursal edge. Laterals cleft nearly all their length, not reaching edge of bursa. Dorsal ray stout, bifurcating near root, branches divergent and each dividing after two-thirds length into two equal rays not reaching edge of bursa. Spicules very long, nearly two-thirds body length. Genital cone large; accessory cone formed by pair of elongate processes.

Female.—Tail pointed, 0·2 mm. long; ovejections 0·4 mm. long, uniting about 1·4 mm. in front of vulva. Vagina twisted; vulva 0·07 mm. in front of anus.

This species resembles *C. longispiculata* J. & M. (1939) in many features, but differs mainly in the form of the dorsal ray and in the absence of a cuticular inflation at the anterior end of the body. It is also very like *C. magnipapillata* J. & M. (1939) but differs

in having a more definite oesophageal bulb, deeper buccal capsule, smaller papillae, and simple tips to the elements of the leaf crown.

Cloacina thetidis Johnston & Mawson 1939*b*. Fig. 12.

This species was described from a female specimen from *Macropus thetis*. Among numerous other worms in the stomach of *Macropus parma* from Ourimbah a male worm was found, agreeing in the structure of the head and oesophageal region with the type female of *C. thetidis*.

The six inner lips each bear an element of the leaf crown as was suggested in the earlier description. Male 4 mm. long. Oesophagus 0·56 mm. in length (1:7 of body length). Spicules very short, 0·48 mm. long, 1:8·3 of body length, broad, with very wide striated alae. Bursal lobes not deeply separated from one another. Ventral rays thin, parallel, cleft for most of length; externo-lateral diverging from laterals at base; laterals parallel, cleft for half length; externo-dorsal arising at base of laterals and its tip raising wall of bursa; dorsal stout, bifurcating at mid-length, each branch giving off a short lateral at about its mid-point. None of the rays reaches the edge of the bursa.

Cyclostrongylus medioannulatus, n. sp. Fig. 13.

From stomach of *Macropus thetis*, Burnett River.

Three females were found, the longest 5 mm. Mouth collar with four double submedian papillae and two larger lateral papillae, each submedian with bifid bristle. Buccal cavity 25μ deep, 31μ wide, supported about mid-length by ring of chitin 5μ deep. Oesophagus cylindrical, narrow, widening suddenly into small terminal bulb at 0·73 mm. from anterior end of head. Excretory pore 0·4 mm. from head end. Tail 0·28 mm. long, ending in narrow point. Vagina 0·3 mm. long; the vulva 0·12 mm. in front of anus. Eggs 40–50μ by 60–70μ.

The worms differ from other Cyclostrongyles in having only a narrow supporting ring around buccal cavity. In this respect they resemble members of the genus *Maplestonema*, but the presence of a cuticular roll around mouth and the difference between the four submedian and the two lateral oval papillae suggest the species belongs to *Cyclostrongylus*. The specific name has relation to the position of the thickened ring in the buccal cavity.

Coronostrongylus coronatus J. & M. 1939*a*. Figs. 14–15.

This species was described from two indifferently preserved specimens, a male from *Macropus wilcoxi*, and a female from *M. thetis*. Several more satisfactory specimens have now been obtained from *M. parma* (Ourimbah) and *M. ruficollis* (Burnett River), although the parasite apparently occurs rarely. We now offer an emended description.

Oesophagus in male 3·6 mm. long, is 0·42 mm. long, 1:8·7 of body length, straight, cylindrical anteriorly, ending in a bulb. Spicule 0·75 mm. long, 1:5 of body length—this difference from the type being probably due to its unwrinkled state. Lobes of bursa deeply separated from one another as in *Pharyngostrongylus*; ventral and lateral lobes covered on their inner surface with irregular papillae. Ventral rays parallel; externo-lateral short, its tip lifting wall of bursa; laterals long, parallel; externo-dorsal arising separately, shorter than laterals, its tip elevating wall of bursa. Dorsal ray very stout, dividing at mid-length into pair of thin branches medially and a pair of short, very wide lateral rays, none of the branches reaching bursal edge. Gubernaculum small, heart-shaped in dorsal view: pair of prebursal papillae, 0·03 mm. in front of anterior end of bursa; genital cone prominent.

In the female the two ovejectors unite to form a vagina 0·32 mm. long. Anus 1 mm. behind vulva and 0·35 mm. from tip of tail. Eggs 60–70μ by 30–40μ.

Globocephaloides thetidis J. & M.

The species was described from a single male worm from the intestine of *Macropus thetis*, Burnett River. Amongst our present material is a female from the duodenum of *Macropus ualabatus*, Milson Island, agreeing in the characters of the head with that male. Length 9·6 mm.; oesophagus 0·76 mm. long, 1:12·6 of body length; vulva 3·3 mm. from

posterior end of worm, its position marked by a small flap of the body wall. Tail conical. Eggs 76–80μ by 33–40μ.

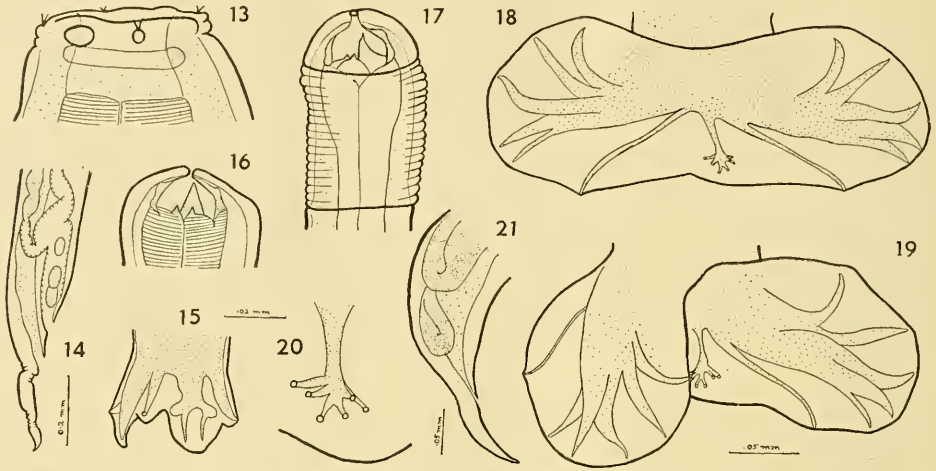


Fig. 13.—*Cyclostrongylus medioannulatus*, head. Figs. 14-15.—*Coronostrongylus coronatus*. 14, posterior end of female; 15, bursa. Figs. 16-21.—*Austrostrongylus aggregatus*. 16, head, dorsal view; 17, anterior end, lateral view; 18, bursa opened wide; 19, more natural position of bursa; 20, dorsal ray; 21, posterior end of female. Figs. 13, 16, 17, and 20 to same scale; figs. 15, 18, and 19.

AUSTROSTRONGYLUS AGGREGATUS, n. sp. Figs. 16–21.

From the duodenum of *Macropus ualabatus*, Milson Island, Lower Hawkesbury, N.S.W. (coll. J. B. Cleland). The worms are very tightly coiled in five or six spirals. Length 3–4 mm. Anterior end surrounded for the first 0·06 mm. of its length by inflated cuticle which, unlike that of the type species, is transversely striated. Remainder of body with two wide lateral and four narrower submedian longitudinal, transversely-striated crests, the laterals continuing as far as vulva in female, the left lateral as far as bursa in male. Buccal capsule 15μ deep, and 20μ wide at base (including the strongly chitinized walls). Dorsal tooth 10μ long; a pair of short subventral teeth present. Oesophagus 0·29 mm. long.

Male.—Spicules very thin, 0·7 mm. long, 1:5 of body length. Bursa large, symmetrical, otherwise similar to that in other species of genus. Externo-dorsal is the only ray reaching bursal edge; all rays directed ventrally at extreme tips. Dorsal ray bifurcating near tip, giving off two pairs of lateral branches just proximal to bifurcation, all branches of dorsal ray appearing to bend ventrally in the bursal wall so that their apparent length in the figure is shorter than their actual length.

Female. Body narrowing suddenly just anterior to anus, then again 20μ before tip, so that end of tail is spine-like. Anus at 0·09 mm. and vulva at 0·4 mm. from posterior end.

The specific name has reference to the closely-grouped branches of the dorsal ray. The species differs from *A. macropodis* Chandler in having a pair of ventral teeth, in the length of spicules, in the symmetry and width of the bursa, and in the length and form of the dorsal ray. It is nearest to *A. wallabiae* J. & M., differing in size and in the shape of the buccal capsule and dorsal tooth, the presence of two ventral teeth, longer spicules, the arrangement of the bursal rays, and the position of vulva, as well as in the absence of masses of granular tissue in bursa and near vulva described for *A. wallabiae*.

SUBULURA PERAGALE, n. sp. Figs. 22–24.

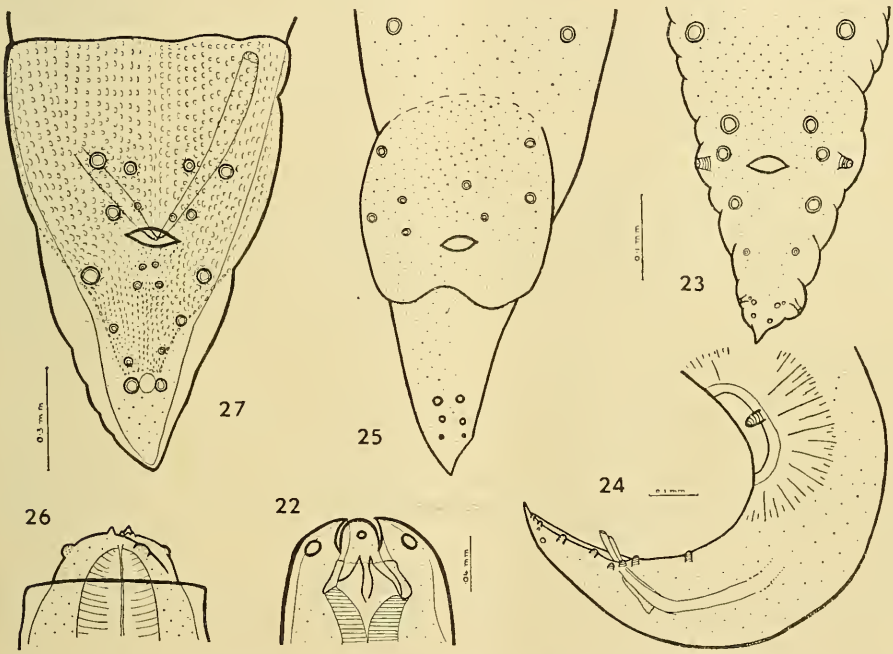
From the stomach of *Peragale minor*, from MacDonald Downs, Central Australia. Males 9–10·6 mm. long; females 13–15 mm. Anterior end with six lips; four submedians each with a large papilla, two laterals each with a smaller papilla. Buccal cavity

0·06 mm. deep, widest at base (diameter 0·05 mm.), posterior half of buccal cavity most strongly chitinized; at junction of this part with the thickened cuticle on inner edges of lips a ring of short vertical striations perhaps due to change in density of the walls. Three large teeth arising from anterior end of oesophagus, and provided with long sharp points reaching half-way up buccal cavity. Oesophagus typical in form, 1·95 mm. long (in a male 10·6 mm. long), with bulb almost spherical, 0·2 mm. in diameter. Nerve ring at 0·4 mm., and the excretory pore at 0·55 mm. from anterior end of worm.

Male. Spicules narrow, 2·9 mm. long, 1:4 of body length. Cloaca 0·21 mm. from tip of tail. Eleven pairs of papillae, of which three pairs are precloacal, two pairs at level of cloaca, and six pairs postcloacal. Gubernaculum present.

Female. Tail elongate, tapering, 0·8 mm. long; vulva 5 mm. from anterior end in worm 14·7 mm. long, i.e. 1:3 of body length from head end. Eggs subglobular, 60–70μ in diameter.

The species differs from *S. peramelis* Baylis in having six, instead of twelve, lips, in the absence of accessory teeth, and in having eleven instead of ten pairs of cloacal papillae in the male.



Figs. 22-24.—*Subulura peragale*. 22, head; 23, posterior end of male, ventral view; 24, posterior end of male, lateral view. Fig. 25.—*Echinonema cinctum*, posterior end of male, ventral view. Figs. 26-27.—*Physaloptera thalacomys*. 26, head; 27, bursa. Figs. 23, 25 and 27 to same scale.

ECHINONEMA CINCTUM Linstow. Fig. 25.

Three females and two males of this species were obtained from the intestine of *Perameles nasuta* from Sydney. They agree very well with the descriptions given by Linstow and by Yorke and Maplestone, except in regard to the male tail. Yorke and Maplestone state that there are no caudal alae. We notice that just posterior to the cloaca there is an expansion of the body which is very like caudal alae except that it is less transparent. The structure merges into the rest of the body about 0·15 mm. in front of cloaca. We have also noted more papillae in this region than were recorded by Yorke and Maplestone. There are in our specimens three pairs near the tip of tail, two pairs just antero-lateral to the cloaca and two pairs lateral to these, one of these pairs being at the upper edge and the other pair about half-way down the expansion of the

body, described above. About 0·25 mm. in front of cloaca is another pair of larger papillae. The group of very small papillae mentioned as occurring near the tip of the tail was not observed.

PHYSALOPTERA THALACOMYS, n. sp. Figs. 26-27.

From the stomach of *Peragale minor*, MacDonald Downs, Central Australia. Stout worms; males up to 2·4 cm.; females to 3·8 cm. long. Cervical collar reaching base of lips; head of female 0·13 mm. across at base of lips; each lip with two large submedian papillae and on its inner edge bearing two median teeth, an inner tripartite and a larger conical external. Oesophagus in male, 5·3 mm. long, muscular part 0·5 mm. long. Nerve ring 0·4 and the excretory pore 0·7 mm. from head end.

Male. Bursa elongate, 1·3 mm. long, 0·6 mm. wide across cloaca, 0·85 mm. wide anteriorly. Spicules not heavily chitinized, one about 0·65 mm. long, the other indistinct and either 0·35 mm. or 0·67 mm. long. Ten pairs of bursal papillae, four pairs preanal and six pairs postanal, arranged as shown in Figure 27. Between the two most posterior pairs of papillae is a structure which may be another papilla but whose outline is not so strongly marked. Small tubercles, arranged for the most part in longitudinal rows, extend over the precloacal part of bursa and are continued over middle part of the tail nearly to the last pair of papillae, leaving each ala free.

Female. Didelphous; vulva 9 mm. from head. Tail rounded, 0·35 mm. long in a 3·8 cm. specimen, and bearing a pair of rounded shallow subterminal ventral papillae. Eggs in vagina 30μ by 45μ.

The species differs from *P. peramelis* J. & M. (from *Perameles nasuta*) in having a long narrow bursa rather than a short wide one, in the position of the excretory pore, and in the number and arrangement of the caudal papillae in the male. It resembles *P. peragale* J. & M. (also from *Peragale minor*) in the size and shape of the bursa, but differs in the number of bursal papillae, the position of the excretory pore, the shape of the female tail, and in the more anterior position of vulva. These three latter are the most striking differences, as the bursal papillae observed in *P. peragale* are irregular in arrangement and probably atypical. The specific name is derived from *Thalacomys minor*, an alternative name of the host.

PHYSALOPTERA SARCOPHILI, n. sp. Figs. 28–29.

From the Tasmanian Devil, *Sarcophilus harrisi*, Tasmanian Biological Survey. Two females, 23 and 13 mm. long, and a male 11 mm. long, were present. Cervical collar wide and loose; in the two shorter specimens covering bases of lips, in the longer reaching nearly to top of lips. Outer tooth on each lip slightly longer than the tripartite median tooth.

Male. Bursa very large, alae thin and much wrinkled, 2 mm. long, 1·2 mm. maximum breadth. Tail 1·1 mm. long. Four pairs long pedunculated papillae (two pairs preanal and two pairs postanal) and three pairs short papillae on medio-ventral surface of tail (as in fig. 29). Spicules very narrow, the wider 0·45 mm., the other 0·7 mm. long.

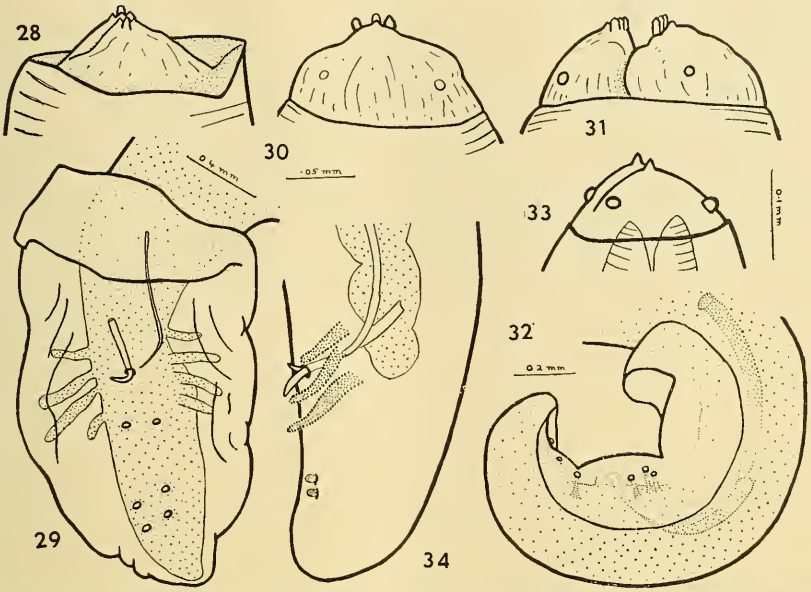
Female. Vulva at one-third length of body from anterior end. Tail rounded at tip; 0·3 mm. long in female 13 mm. long.

PHYSALOPTERA PARVICOLLARIS, n. sp. Figs. 30–32.

From *Perameles nasuta*, Sydney. Two worms present, a male 14·6 mm. and a female 16·3 mm. in length. Collar much reduced, being merely a ridge at base of lips. Each lip with three large median teeth and a shorter tooth external to these; a pair of small papillae on each lip. Oesophagus 4 mm. long in male, anterior part 0·5 mm. long. Nerve ring 0·4 mm. from head end.

Male. The only specimen was so twisted that a view of the ventral caudal region could not be obtained, hence the description of the papillae is incomplete. In lateral view there were seen three pairs of pedunculated precloacal papillae, one more medially situated than the other two, one pair of pedunculated post-cloacal papillae, and two pairs of short papillae situated between the cloaca and the tip of tail. Tail 0·4 mm. long. Spicules not well seen even in creosote, one 0·47 mm. and the other probably 0·8 mm. long.

Female. Tail bluntly rounded; vulva 6·9 mm. from anterior end, 1:2·4 of body length from head.



Figs. 28-29.—*Physaloptera sarcophili.* 28, head, lateral view; 29, bursa, ventral view. Figs. 30-32.—*Physaloptera parvicollaris.* 30, head, lateral view; 31, head, ventral view; 32, bursa, lateral view. Figs. 33-34.—*Physaloptera papuensis.* 33, head; 34, posterior end of male. Figs. 30 and 31 to same scale; figs. 28 and 33; figs. 32 and 34.

Physaloptera papuensis, n. sp. Figs. 33–34.

These worms were obtained from a mammal collected at Mount Lamington, Papua, by Mr. D. McNamara and forwarded to the South Australian Museum. The identification of the host is uncertain but evidence points to it being a bandicoot. The native name, partly defaced on the label containing the parasites, appears to be Masia.

The females are very long, young ones 2·4 cm., older up to 6 cm.; males about 2–3 cm. All specimens very poorly preserved. Lips extending above the level of the collar; each with large median tooth and possibly two lateral. Four large submedian papillae. Nerve ring towards base of muscular part of oesophagus, 0·55 mm. from anterior end of worm. Posterior end of all males very macerated, extent of alae indeterminable, and ventral view unobtainable. Five pairs of pedunculate papillae, three preanal and two shorter postanal, can be seen; one specimen shows four preanal. There are also one pair preanal and two pairs immediately postanal sessile papillae, and there may be more towards posterior end. Spicules straight, tapering to a point, longer and thinner spicule 0·7 mm., shorter 0·35 mm.

Female.—Vulva dividing body antero-posteriorly in ratio 2:3.

This species differs from those known from marsupials in its much greater length and in the number and position of the cloacal papillae. The geographical distribution of the hosts is quite different.

Dipetalonema sp.

From lung of *Perameles nasuta*, Sydney. All the worms are broken and in a poor state of preservation so that their structure is difficult to make out. All the pieces present belong to females and are filled with larvae. Maximum width 0·35 mm. Head 0·03 mm. diameter, with four, possibly six, papillae. Small mouth leading to tubular vestibule 0·01 mm. long followed by oesophagus 0·26 mm. long, latter apparently short in relation to body length. Tail 0·1 mm. long, conical, tip ending in a narrow point. Vulva a short distance behind oesophagus.

Literature.

BAYLIS, H. A., 1930.—Some Heterakidae and Oxyuridae (Nematoda) from Queensland. *Ann. Mag. Nat. Hist.*, (10) 5, 354-366.

CHANDLER, A., 1924.—A new genus of Trichostrongylid worm from a kangaroo. *Parasitology*, 16, 160-163.

JOHNSTON, T. H., and MAWSON, P. M., 1939*a*.—Strongyle Nematodes from Queensland Marsupials. *Trans. Roy. Soc. S. Aust.*, 63, 121-148.

————, 1939*b*.—Strongylate Nematodes from Marsupials in New South Wales. PROC. LINN. SOC. N.S.W., 64, 513-536.

————, 1939*c*.—Sundry Nematodes from Eastern Australian Marsupials. *Trans. Roy. Soc. S. Aust.*, 63, 204-209.

LINSTOW, O., 1898.—Nemathelminthen gesammelt von Herrn Prof. Dr. F. Dahl in Bismarck Archipelago. *Arch. f. Naturg.*, 63 (1), 281-291.

————, 1898.—Nemathelminthen von Herrn Richard Semon in Australien gesammelt. Semon's Forschungsreisen in Australien. (5). *Denk. Med. Nat. Ges. Jena*, 8, 469-471.

YORKE, W., and MAPLESTONE, P. A., 1926.—The Nematode Parasites of Vertebrates. London.